

ABSTRACT

[0031] An alloy of aluminum, lithium, magnesium, zirconium, and scandium is formed with a rapid solidification process to retain desired metastable phases. A solid freeform fabrication device uses a heat source to melt a feedstock delivered through one or more guide nozzles. The heat source and the nozzles are mounted to a movable platform that positions the heat source and the nozzles in a desired location for each section or layer of the part being formed. The nozzles are located at 90° increments in an array having a selected radius from, and being centered on the heat source. The device forms adjacent, side-by-side layers to form the width of the part, and is used to form adjacent, stacked layers to create the height of the part.